

What is claimed is:

- 1 1. A method for setting up a down-stream communication session in a basic
2 service set (BSS) in a wireless network, the communication session having a defined quality
3 of service (QoS), the method comprising steps of:
4 detecting a first Path message and a first Resv message (Path/Resv message)
5 of a RSVP protocol at a designated subnet bandwidth manager (DSBM) in a station having a
6 point coordinator (PC), the first Resv message originating from a subnet bandwidth manager
7 (SBM) of a non-PC station in the BSS, and requesting a resource reservation for setting up a
8 down-stream session between the PC station and at least one destination non-PC station in
9 the BSS;
10 extracting at the DSBM a QoS parameter set and a classifier from the first
11 Path/Resv message for the session;
12 determining at the DSBM whether to admit the down-stream session to the
13 network based on the QoS parameter set defining the session and a channel status report on a
14 medium access control (MAC) sublayer of the BSS;
15 when the down-stream session is admitted, setting up by a QoS management
16 entity (QME) of the PC station a virtual down-stream (VDS) between the PC station and the
17 destination non-PC station for transporting the down-stream session traffic, the DSBM being
18 part of the QME in the PC station.

1 2. The method according to claim 1, further comprising steps of:
2 assigning by the QME a virtual stream identifier (VSID) to the VDS;
3 instructing by the QME a frame classification entity (FCE) to create an entry
4 corresponding to the VDS in a frame classification table of the FCE, the FCE being logically
5 located in a logical link control (LLC) sublayer of the PC station, the entry in the frame
6 classification table including the VSID and the classifier associated with the down-stream
7 session; and
8 instructing by the QME a frame scheduling entity (FSE) to create an entry
9 corresponding to the VDS in a frame scheduling table of the FSE, the FSE being logically
10 located in the MAC sublayer of the PC-station, the entry in the frame scheduling table
11 including the VSID and the QoS parameter set associated with the down-stream session.

1 3. The method according to claim 2, further comprising a step of sending a first
2 management frame from the PC station to each destination non-PC station in the BSS, the
3 first management frame including information relating to a setup of the VDS defined by the
4 VSID.

1 4. The method according to claim 2, further comprising steps of:
2 detecting a second Path/Resv message at the DSBM, the second Path/Resv
3 message originating outside the DSBM and requesting a change of at least one QoS

4 parameter value associated with the down-stream session;
5 extracting at the DSBM the changed QoS parameter set and the classifier from
6 the second Path/Resv message for the session;
7 finding at the QME the VSID that is associated with the extracted classifier;
8 determining at the DSBM whether to grant the request for change based on
9 the changed QoS parameter set and the channel status report;
10 when the request is not granted, operating the down-stream session according
11 to the QoS parameter set contained in the frame scheduling table for the VDS; and
12 when the request is granted, instructing by the QME the FSE to update the
13 entry in the frame scheduling table corresponding to the VDS by changing at least one QoS
14 parameter value associated with the VDS based on the requested change.

1 5. The method according to claim 2, further comprising steps of:
2 detecting a third Path/Resv message at the DSBM, the third Path/Resv
3 message originating outside the DSBM and requesting that a down-stream session be
4 terminated;
5 extracting at the DSBM the classifier from the third Path/Resv message for
6 the session;
7 finding at the QME the VSID that is associated with the extracted classifier;
8 instructing by the QME the FCE to delete the entry corresponding to the VDS

9 in the frame classification table;
10 instructing by the QME the FSE to delete the entry corresponding to the VDS
11 in the frame scheduling table; and
12 sending a second management frame from the PC station to each destination
13 non-PC station in the BSS, the second management frame including information relating to a
14 teardown of the VDS defined by the VSID.

1 6. The method according to claim 5, further comprising steps of:
2 detecting a timeout event at the DSBM, the timeout event being triggered by a
3 predetermined length of time elapsing and not receiving one of the first Path/Resv message
4 and the second Path/Resv message for a down-stream session;
5 extracting at the DSBM the classifier from one of the first Path/Resv message
6 and the second Path/Resv message previously received for the down-stream session;
7 finding at the QME the VSID that is associated with the extracted classifier;
8 instructing by the QME the FCE to delete the entry corresponding to the VDS
9 in the frame classification table;
10 instructing by the QME the FSE to delete the entry corresponding to the VDS
11 in the frame scheduling table; and
12 sending a third management frame from the PC-station to each destination
13 non-PC station in the BSS, the third management frame including information relating to a

14 teardown of the VDS defined by the VSID.

1 7. The method according to claim 1, wherein before the step of detecting the
2 Resv message at the DSBM, the method comprises steps of:
3 receiving the first Path message for the down-stream session at the DSBM, the
4 first Path message being sent from a RSVP agent of a source station located outside the BSS
5 and propagated to the DSBM;
6 sending the first Path message for the session from the DSBM to an SBM of
7 each destination non-PC station in the BSS;
8 receiving the first Resv message for the session at the DSBM, the first Path
9 message being sent from the SBM of a destination non-PC station in the BSS; and
10 wherein after the step of determining at the DSBM whether to admit the
11 down-stream session to the network, the method further comprises a step of propagating the
12 first Resv message for the session from the DSBM to the RSVP agent of the source station
13 located outside the BSS.

1 8. The method according to claim 1, wherein the wireless network is a wireless
2 local area network (WLAN).

1 9. A point coordinator (PC) station in a basic service set (BSS) in a wireless
2 network, the PC station comprising:

3 a designated subnet bandwidth manager (DSBM) detecting a first Path
4 message and a first Resv message (Path/Resv message) of a RSVP protocol, the first Resv
5 message originating from a subnet bandwidth manager (SBM) of a non-PC station in the
6 BSS and requesting a resource reservation for setting up a down-stream session between the
7 PC station and at least one destination non-PC station in the BSS, the DSBM extracting a
8 quality of service (QoS) parameter set and a classifier from the first Path/Resv message for
9 the session, and determining whether to admit the down-stream session to the network based
10 on the QoS parameter set defining the session and a channel status report on a medium
11 access control (MAC) sublayer of the BSS; and

12 a QoS management entity (QME) responsive to the DSBM admitting the
13 session setting up a virtual down-stream (VDS) between the PC station and the destination
14 non-PC station for transporting the down-stream session traffic, the DSBM being part of the
15 QME in the PC station.

1 10. The PC station according to claim 9, wherein the QME assigns a virtual
2 stream identifier (VSID) to the VDS, instructs a frame classification entity (FCE) to create an
3 entry corresponding to the VDS in a frame classification table of the FCE, the FCE being
4 logically located in a logical link control (LLC) sublayer of the PC station, the entry in the

5 frame classification table including the VSID and the classifier associated with the down-
6 stream session, and instructs a frame scheduling entity (FSE) to create an entry corresponding
7 to the VDS in a frame scheduling table of the FSE, the FSE being logically located in the
8 MAC sublayer of the PC-station, and the entry in the frame scheduling table including the
9 VSID and the QoS parameter set associated with the down-stream session.

1 11. The PC station according to claim 10, wherein the QME sends a first
2 management frame from the PC station to each destination non-PC station in the BSS, the
3 first management frame including information relating to a setup of the VDS defined by the
4 VSID.

1 12. The PC station according to claim 10, wherein the DSBM detects a second
2 Path/Resv message at the DSBM, the second Path/Resv message originating outside the
3 DSBM and requesting a change of at least one QoS parameter value associated with the
4 down-stream session, the DSBM extracting the changed QoS parameter set and the classifier
5 from the second Path/Resv message for the session,

6 wherein the QME finds the VSID that is associated with the extracted
7 classifier;

8 wherein the DSBM determines whether to grant the request for change based
9 on the changed QoS parameter set and the channel status report,

10 wherein when the request is not granted, the down-stream session is operated
11 according to the QoS parameter set contained in the frame scheduling table for the VDS, and
12 wherein when the request is granted, the QME instructs the FSE to update the
13 entry in the frame scheduling table corresponding to the VDS by changing at least one QoS
14 parameter value associated with the VDS based on the requested change.

1 13. The PC station according to claim 10, wherein the DSBM detects a third
2 Path/Resv message, the third Path/Resv message originating outside the DSBM and
3 requesting that a down-stream session be terminated, the DSBM extracting the classifier
4 from the third Path/Resv message for the session, and
5 wherein the QME finds the VSID that is associated with the extracted
6 classifier, instructs the FCE to delete the entry corresponding to the VDS in the frame
7 classification table, instructs the FSE to delete the entry corresponding to the VDS in the
8 frame scheduling table, and sends a second management frame from the PC station to each
9 destination non-PC station in the BSS, the second management frame including information
10 relating to a teardown of the VDS defined by the VSID.

1 14. The PC station according to claim 13, wherein the DSBM detects a timeout
2 event at the DSBM, the timeout event being triggered by a predetermined length of time
3 elapsing and not receiving one of the first Path/Resv message and the second Path/Resv

4 message for a down-stream session, the DSBM extracting the classifier from one of the first
5 Path/Resv message and the second Path/Resv message previously received for the down-
6 stream session, and

7 wherein the QME finds the VSID that is associated with the extracted
8 classifier, instructs the FCE to delete the entry corresponding to the VDS in the frame
9 classification table, instructs the FSE to delete the entry corresponding to the VDS in the
10 frame scheduling table, and sends a third management frame from the PC-station to each
11 destination non-PC station in the BSS, the third management frame including information
12 relating to a teardown of the VDS defined by the VSID.

1 15. The PC station according to claim 9, wherein before the DSBM detects the
2 Resv message, the DSBM receives the first Path message for the down-stream session at the
3 DSBM, the first Path message being sent from a RSVP agent of a source station located
4 outside the BSS and propagated to the DSBM, the DSBM sending the first Path message for
5 the session to an SBM of each destination non-PC station in the BSS, the DSBM receiving
6 the first Resv message for the session, the first Path message being sent from the SBM of a
7 destination non-PC station in the BSS, and

8 wherein after the DSBM determines whether to admit the down-stream
9 session to the network, the DSBM propagates the first Resv message for the session from the
10 DSBM to the RSVP agent of the source station located outside the BSS.

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